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## BULLETIN BIBLIOGRAPHIQUE

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John W. MORGAN, Tomasz MROWKA, Daniel RUBERMAN. — **The  $L^2$ -moduli space and a vanishing theorem for Donaldson polynomial invariants.** — Monographs in geometry and topology, vol. 2. — Un vol. relié,  $16 \times 23,5$ , de 222 p. — International Press, Boston, 1995.

The  $L^2$ -moduli space for manifolds with cylindrical ends: The  $L^2$ -moduli space. Chern-Simons flow and ASD connections on a cylinder. Regularity and estimates for the flow equation. Existence of asymptotic value at infinity. The finite dimensional ODE dominating the Chern-Simons flow. Geometric limits as we stretch the tube out. — The thickened moduli space: Definition. Structure of the fibers. A generic metrics theorem for the thickened moduli space. Slices and the local structure. — Circle bundles over Riemann surfaces: Generalities on stratified spaces. The relationship of the center manifold to the Kuranishi picture for a general 3-manifold. Local data for the representation variety. The moduli space. The case of  $SO(3)$  moduli spaces. A vanishing result for 4-manifolds split by certain 3-dimensional nilmanifolds.

**Low-dimensional topology.** — Conference held at the University of Tennessee, Knoxville, May 18-23, 1992. — Edited by Klaus Johannson. — Conference proceedings and lecture notes in geometry and topology, vol. 3. — Un vol. relié,  $15,5 \times 23,5$ , de xiv, 239 p. — International Press, Boston, 1995.

Special emphasis was given to hyperbolic and combinatorial structures, minimal surface theory, negatively curved groups, group actions on  $R$ -trees and gauge theoretic aspects of 3-manifolds. Several other topics were represented as well, such as knot- and foliation-theory.

Dusa McDUFF and Dietmar SALAMON. — **Introduction to symplectic topology.** — Oxford mathematical monographs. — Un vol. relié,  $16 \times 24$ , de viii, 425 p. — Prix: £45.00. — Clarendon Press, Oxford, 1995.

Foundations: From classical to modern. Linear symplectic geometry. Symplectic manifolds. Almost complex structures. — Symplectic manifolds: Symplectic reduction. Constructing symplectic manifolds. Existence and uniqueness. — Symplectomorphisms: Area-preserving diffeomorphisms. Generating functions. The group of symplectomorphisms. — Symplectic invariants: The Arnold conjecture. Symplectic invariants.

H.E. ROSE. — **A course in number theory.** — Second edition. — Un vol. broché,  $16 \times 23,5$ , de xv, 398 p. — Prix: £22.00. — Clarendon Press, Oxford, 1995.

This textbook excludes topics relying heavily on complex analysis and advanced algebraic number theory. The following areas of the subject are treated: divisibility and multiplicative functions, congruences and quadratic residues, the basics of algebraic numbers and sums of squares, continued fractions, diophantine approximations and transcendence, quadratic forms, partitions, the prime numbers, diophantine equations, elliptic curves (considerably extended for this edition). The increased use of computers in number theory is reflected in many sections.



**Theory and numerics of ordinary and partial differential equations.** — Edited by M. Ainsworth, J. Levesley, W.A. Light, and M. Marletta. — Advances in numerical analysis, vol. 4. — Un vol. relié, 16×24, de XI, 333 p. — Prix: £35.00. — Clarendon Press, Oxford, 1995.

G.F. Corliss: Guaranteed error bounds for ODEs. — K. Eriksson, D. Estep, P. Hansbo, C. Johnson: Introduction to computational methods for differential equations. — L.A. Petzold: Numerical solution of differential-algebraic equations. — I.H. Sloan: Boundary element methods. — A. Stewart: Perturbation theory for infinite dimensional dynamical systems. — M. Zennaro: Delay differential equations: theory and numerics.

Kevin BURRAGE. — **Parallel and sequential methods for ordinary differential equations.** — Numerical mathematics and scientific computation. — Un vol. relié, 16×24, de XVI, 446 p. — Prix: £50.00. — Clarendon Press, Oxford, 1995.

This book presents an up to date exposition of numerical methods for solving ordinary differential equations in a parallel computing environment. Although the main focus is on problems of initial value type, consideration will also be given to boundary value problems and partial differential equations. Furthermore, because linear algebra is an important component in the solution of differential equations, a complete chapter is devoted to the parallel solution of linear systems of equations. Two additional chapters are devoted to a summary of existing sequential differential equations methods.

Solomon G. MIKHLIN, Nikita F. MOROZOV, Michael V. PAUKSHTO. — **The integral equations of the theory of elasticity.** — Translated from the Russian by Rainer Radok. — Edited by Herbert Gajewski. — Teubner-Texte zur Mathematik, vol. 135. — Un vol. broché, 16×24, de 375 p. — Prix: DM 64.80. — B.G. Teubner Verlagsgesellschaft, Stuttgart, 1995.

This book is devoted to the methods and results of the integral equations theory for elasticity problems. It consists of two parts and an appendix. The first part contains a survey of mathematical topics necessary for understanding the main aspects of this course. The second part deals with the most important results in the theory of boundary integral equations. It also discusses some new aspects of this theory which have been suggested by the authors, including the following problems: the theory of elasticity for an anisotropic medium, new type of integral equations (Pobedria's type), contact problems, fracture mechanics and Cosserat spectrum.

T. BASTIN, C.W. KILMISTER. — **Combinatorial physics.** — Series on knots and everything, vol. 9. — Un vol. relié, 16×22,5, de VII, 178 p. — Prix: US\$38.00. — World Scientific, Singapore, 1995.

The authors aim to reinstate a spirit of philosophical enquiry in physics. They abandon the intuitive continuum concepts and build up constructively a combinatorial mathematics of process. This radical change alone makes it possible to calculate the coupling constants of the fundamental fields which — via high energy scattering — are the bridge from the combinatorial world into dynamics.

**Dirichlet forms and stochastic processes.** — Proceedings of the International Conference held in Beijing, China, October 25-31, 1993. — Edited by Z.M. Ma, M. Röckner, J.A. Yan. — Un vol. relié, 17,5×24,5, de XI, 443 p. — Prix: DM 268.00. — W. de Gruyter, Berlin, 1995.

This volume contains 38 selected papers related to lectures given by the authors at the International Conference and at the School on Dirichlet Forms, October 18-24, 1993, held in

Beijing. The theory of Dirichlet forms establishes a link between various fields of analysis and of probability theory. The substantial progress of the theory has led to various new applications in related areas of mathematics, mathematical physics and biology. An essential part of this wide range of the theory is reflected in this volume.

**Symposia Gaussiana: Conference B: Statistical sciences, Munich, Germany, August 2-7, 1993.** — Proceedings of the 2nd Gauss Symposium. — Edited by Volker Mammitzsch, Hans Schneeweiss. — Un vol. relié, de  $17 \times 24,5$ , de x, 341 p. — Prix: DM 268.00. — W. de Gruyter, Berlin, 1995.

This volume contains a selection of refereed papers presented at the conference. The contributions to this volume are arranged by topics and cover a wide spectrum of statistics, ranging from mathematical foundations, including probability theory, to its applications in various fields such as biometrics, econometrics, social sciences and expert systems.

**Symposia Gaussiana: Conference A: Mathematics and theoretical physics, Munich, Germany, August 2-7, 1993.** — Proceedings of the 2nd Gauss Symposium. — Edited by Minaketan Behara, Rudolf Fritsch, Rubens G. Lintz. — Un vol. relié, de  $17,5 \times 24,5$ , de xx, 744 p. — Prix: DM 328.00. — W. de Gruyter, Berlin, 1995.

The contributions to this volume are arranged by topics belonging to the following sections of the conference: Mathematical education. — History of mathematics. — Mathematical logic. — Algebra and number theory. — Geometry. — Analysis of several complex variables. — Algebraic topology. — Quantum groups and q-deformation. — Computational physics. — Relativistic celestial mechanics. — Gauss and geomagnetism. — General.

**Semigroups in algebra, geometry and analysis.** — Edited by Karl H. Hofmann, Jimmie D. Lawson, Ernest B. Vinberg. — De Gruyter expositions in mathematics, vol. 20. — Un vol. relié,  $17,5 \times 24,5$ , de xii, 370 p. — Prix: DM 198.00. — W. de Gruyter, Berlin, 1995.

This book collects fourteen surveys by different experts in the Lie theory of semigroups with applications in various fields of contemporary mathematics, such as representation theory of Lie groups, algebraic geometry, relativity, probability, and geometric control theory. Contents: Lie semigroups, ordered symmetric spaces and causality. — Invariant cones, Ol'shanskii-semigroups, exponential semigroups. — Convexity theorems, representation theory. — Semisimple Lie groups and semigroups. — Applications: control and probability.

**Geometric group theory.** — Proceedings of a Special Research Quarter at the Ohio State University, Spring 1992. — Edited by Ruth Charney, Michael Davis, Michael Shapiro. — Ohio State University Mathematical Research Institute Publications, vol. 3. — Un vol. relié,  $17,5 \times 24,5$ , de 186 p. — Prix: DM 148.00. — W. de Gruyter, Berlin, 1995.

The field of geometric group theory has seen a rapid growth over the past few years due to the introduction of new geometric and algorithmic techniques. This progress is reflected in the present volume which includes papers on automatic groups, hyperbolic groups, complexes of groups, and metric curvature, as well as more traditional areas of combinatorial group theory. It also contains a list of open problems.

**Surveys in differential geometry.** — Proceedings of the Conference on Geometry and Topology, held at Harvard University, April 27-29, 1990. — Supplement to the Journal of differential geometry, no 1. — Un vol. broché,  $17 \times 25,5$ , de 310 p. — International Press, Boston, 1991.

Contents: R. Bott: Stable bundles revisited. — G. D'Ambra & M. Gromov: Lectures on transformation groups: geometry and dynamics. — J. Kollar: Flips, flops, minimal models, etc. — R.M. Schoen: A report on some recent progress on nonlinear problems in geometry. — E. Witten: Two dimensional gravity and intersection theory on moduli space.

Richard B. MELROSE. — **The Atiyah-Patodi-Singer index theorem.** — Research notes in mathematics, vol. 4. — Un vol. relié,  $16 \times 23,5$ , de x, 377 p. — Prix: US\$59.95. — A.K. Peters, Wellesley MA, 1993.

The A-P-S theorem is used here as a pivot to discuss some important aspects of geometry and analysis on manifolds with boundary. Melrose's straight-forward approach is to immediately "state and prove" the theorem and then use the subsequent chapters to flesh out these initial concepts. He goes on to provide a comprehensive introduction to the "*b*" category and the related calculus of *b*-pseudodifferential operators on boundaried compact manifolds.

José A. de AZCARRAGA and José M. IZQUIERDO. — **Lie groups, Lie algebras, cohomology and some applications in physics.** — Cambridge monographs on mathematical physics. — Un vol. relié,  $18 \times 25,5$ , de xvii, 455 p. — Prix: £65.00. — Cambridge University Press, Cambridge, 1995.

This book provides a self-contained introduction to the cohomology theory of Lie groups and algebras and to some of its applications in physics. The topics treated include the differential geometry of Lie groups, fibre bundles and connections, characteristic classes, index theorems, monopoles, instantons, extension of Lie groups and algebras, some applications in supersymmetry, Chevalley-Eilenberg approach to Lie algebra cohomology, symplectic cohomology, jet-bundle approach to variational principles in mechanics, Wess-Zumino-Witten terms, infinite Lie Algebras, the cohomological descent in mechanics and in gauge theories and anomalies.

Wolodymyr V. PETRYSHYN. — **Generalized topological degree and semilinear equations.** — Cambridge tracts in mathematics, vol. 117. — Un vol. relié,  $16 \times 23,5$ , de x, 240 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1995.

This book describes the construction of the generalized topological degree for densely defined and not necessarily continuous *A*-proper operators, and presents important applications. *A*-proper mappings arise naturally in the solution to an equation in infinite dimensional space via the finite dimensional approximation. The theory subsumes classical theory involving compact vector fields as well as the more recent theories of condensing vector fields and strongly monotone and strongly accretive maps.

Richard A. BRUALDI and Bryan L. SHADER. — **Matrices of sign-solvable linear systems.** — Cambridge tracts in mathematics, vol. 116. — Un vol. relié,  $16 \times 23,5$ , de xii, 298 p. — Prix: £30.00. — Cambridge University Press, Cambridge, 1995.

The large and diffuse body of literature connected with sign-solvability is presented as a coherent whole for the first time in this book, displaying it as a beautiful interplay between combinatorics (especially graph theory) and linear algebra. Results in the literature are presented in a new and organized way with many new connections established and with many new results and proofs. One of the features of this book is that algorithms that are implicit in many of the proofs have been explicitly described and their complexity has been commented on.

**Novikov conjectures, index theorems and rigidity, Oberwolfach 1993.** — Edited by Steven C. Ferry, Andrew Ranicki and Jonathan Rosenberg. — London Mathematical Society

lecture note series, vol. 226 and vol. 227. — Deux vol. brochés,  $15 \times 22,5$ , de respectivement, x, 372 p. et x, 364 p. — Prix: £24.95 chacun des deux volumes. — Cambridge University Press, Cambridge, 1995.

The first volume contains a detailed historical survey and bibliography of the Novikov Conjecture and of related subsequent developments, including an annotated reprint of Novikov's original 1970 statement of his Conjecture (in Russian and in English); an annotated problem list; the texts of several important unpublished classic papers by Milnor, Browder, Kasparov; and research/survey papers on the conjecture by Ferry/Weinberger, Gromov, Mischenko, Quinn, Ranicki, and Rosenberg. — The second volume contains fundamental research papers by G. Carlsson on "Bounded  $K$ -theory and the assembly map in algebraic  $K$ -theory" and E. Pedersen on "Epsilon surgery theory"; shorter papers on various topics related to the Conjecture, by Bekka/Cherix/Valette, Eichhorn, Ferry, Higson/Roe, Hurder, Pedersen, Pedersen/Roe/Weinberger, Thomas, Troitsky, and Weiss/Williams.

Richard J. GARDNER. — **Geometric tomography.** — Encyclopedia of mathematics and its applications, vol. 58. — Un vol. relié,  $16,5 \times 24$ , de xv, 424 p. — Prix: £45.00. — Cambridge University Press, Cambridge, 1995.

Geometric tomography deals with the retrieval of information about a geometric object from data concerning its projections (shadow) on planes or cross-sections by planes. The main text of this book contains a rigorous treatment of the subject and supplies background for the 72 unsolved problems stated. Each chapter ends with extensive notes, including historical remarks, biographies, and a bibliography with over 500 references.

Jerzy ZABCZYK. — **Mathematical control theory: an introduction.** — Systems & control: foundations & applications. — Un vol. relié,  $16 \times 24$ , de viii, 260 p. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1995.

This book presents, in a mathematically precise manner, a unified introduction to deterministic control theory. The author includes the stabilization of nonlinear systems using topological methods, realization theory for nonlinear systems, impulsive control and positive systems, the control of rigid bodies, the stabilization of infinite dimensional systems and the solution of minimum energy problems.

**Operator theory and boundary eigenvalue problems.** — International Workshop in Vienna, July 27-30, 1993. — Edited by I. Gohberg and H. Langer. — Operator theory, vol. 80. — Un vol. relié,  $17 \times 24$ , de x, 313 p. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1995.

The main topics at the workshop were interpolation problems and analytic matrix functions, operator theory in spaces with indefinite scalar products, boundary value problems for differential and functional-differential equations and systems theory and control. The workshop covered different aspects, starting with abstract operator theory up to concrete applications.

M.K. BENNETT. — **Affine and projective geometry.** — A Wiley Interscience publication. — Un vol. relié,  $16 \times 24$ , de xvi, 229 p. — Prix: £45.00. — John Wiley & Sons, New York, 1995.

The first part of the book deals with the correlation between synthetic geometry and linear algebra. In the second part, geometry is used to introduce lattice theory, and the book culminates with the fundamental theorem of projective geometry. Throughout, the text explores geometry's correlation to algebra in ways that are meant to foster inquiry and develop mathematical insights whether or not one has a background in algebra.

P.M. COHN. — **Algebra, vol. 3.** — Second edition. — Un vol. broché,  $15 \times 23$ , de XII, 474 p. — Prix: £ 19.99. — John Wiley & Sons, Chichester, 1991.

In this edition you will find several new chapters on groups, skew fields and universal algebra, as well as additional sections on Morita equivalence, linear groups, generalized polynomial identities and others. — Contents: — Universal algebra. — Multilinear algebra. — Homological algebra. — Further group theory. — Further field theory. — Algebras. — Central simple algebras. — Quadratic forms and ordered fields. — Noetherian rings and polynomial identities. — Rings without finiteness assumptions. — Skew fields.

**Handbook of incidence geometry: buildings and foundations.** — Edited by F. Buekenhout. — Un vol. relié,  $17,5 \times 25$ , de XI, 1420 p. — Prix: Dfl. 390.00. — North-Holland, Amsterdam, 1995.

This handbook deals with the foundations of incidence geometry, in relationship with division rings, rings, algebras, lattices, groups, topology, graphs, logic and its autonomous development from various viewpoints. Projective and affine geometry are covered in variety of ways. Major classes of rank 2 geometries such as generalized polygons and partial geometries are surveyed extensively. More than half of the book is devoted to buildings at various levels of generality, including a detailed and original introduction to the subject, a broad study of characterizations in terms of points and lines, applications to algebraic groups, extensions to topological geometry, a survey of results on diagram geometries and nearby generalizations such as matroids.

**Handbook of algebraic topology.** — Edited by I.M. James. — Un vol. relié,  $17,5 \times 25$ , de X, 1324 p. — Prix: Dfl. 390.00. — North-Holland, Amsterdam, 1995.

Algebraic topology is very much an international subject and this is reflected in the background of the 36 leading experts who have contributed to the handbook. Written for the reader who already has a grounding in subject, the volume consists of 27 expository surveys covering the most active areas of research. They provide the researcher with an up-to-date overview of this branch of mathematics.

H.F. BAKER. — **Abelian functions: Abel's theorem and the allied theory of theta functions.** — Cambridge mathematical library. — Un vol. broché,  $15 \times 23$ , de XXXV, 684 p. — Prix: £ 27.95. — Cambridge University Press, Cambridge, 1995.

This book contains more than its modest title suggests. Written in 1897, its scope was as broad as it could possibly be, namely to cover the whole of algebraic geometry, and associated theories. The subject is discussed by Baker in terms of transcendental functions, and in particular theta functions. Many of the ideas put forward are of continuing relevance today, and some of the most exciting ideas from theoretical physics draw on work presented here.

Gérard LAUMON. — **Cohomology of Drinfeld modular varieties, Part 1: Geometry, counting of points and local harmonic analysis.** — Cambridge studies in advanced mathematics, vol. 41. — Un vol. relié,  $16 \times 23,5$ , de XIII, 344 p. — Prix: £ 40.00. — Cambridge University Press, Cambridge, 1996.

This book aims to provide an introduction to both the subject of this title and the Langlands correspondence for function fields. These varieties are the analogues for function fields of Shimura varieties over number fields. This present volume is devoted to the geometry of the



Drinfeld modular varieties and to the local harmonic analysis needed to compute their cohomology. It is based on courses given by the author, who follows methods which are extensions of those used to study Shimura varieties.

Gerald B. FOLLAND. — **Introduction to partial differential equations.** — Second edition. — Un vol. relié,  $16 \times 24$ , de XI, 324 p. — Prix: US\$39.50. — Princeton University Press, Princeton, N.J., 1995.

The first chapters deal with classical theory: first-order equations, local existence theorems, and an extensive discussion of the fundamental differential equations of mathematical physics. The techniques of modern analysis, such as distributions and Hilbert spaces, are used wherever appropriate. The last chapters introduce the modern theory: Sobolev spaces, elliptic boundary value problems, and pseudodifferential operators.

P.A. GRILLET. — **Semigroups: an introduction to the structure theory.** — Monographs and textbooks in pure and applied mathematics, vol. 193. — Un vol. relié,  $16 \times 23,5$ , de IX, 398 p. — Prix: US\$150.00. — Marcel Dekker, New York, 1995.

Providing a core of classical results, Semigroups offers, for the first time in a self-contained volume, a concise coverage of the structure theory of semigroups, ... examines associativity and products, homomorphisms, congruences, and free semigroups, ... discusses Green's relations and the Rees-Shushkevich theorem, ... describes ideal extensions, semilattice decompositions, subdirect products, and group coextensions, and presents the most important theorems for each area of commutative, finite, regular, and inverse semigroups.

**Complex analysis and geometry.** — Proceedings of the conference at Trento. — Edited by Vincenzo Ancona, Edoardo Ballico, Alessandro Silva. — Lecture notes in pure and applied mathematics, vol. 173. — Un vol. broché,  $18 \times 25,5$ , de XIII, 554 p. — Prix: US\$175.00. — Marcel Dekker, New York, 1995.

Based on a recently held conference in Trento, Italy, sponsored by the Centro Internazionale per la Ricerca Matematica, this book presents the contributions from more than 35 internationally recognized experts in several complex variables and related topics such as transcendental algebraic geometry, infinite dimensional supermanifolds, and foliations.

**Zero-dimensional commutative rings.** — Proceedings of the 1994 John H. Barrett Memorial Lectures and Conference on Commutative Ring Theory. — Edited by David F. Anderson, David E. Dobbs. — Lecture notes in pure and applied mathematics, vol. 171. — Un vol. broché,  $17,5 \times 25,5$ , de XI, 377 p. — Prix: US\$135.00. — Marcel Dekker, New York, 1995.

Examining wide-ranging developments in commutative ring theory, this proceedings covers von Neumann regular rings, integrality, prime ideals, and chain conditions, integral domains, integer-valued polynomials, and factorization, dimension theories, pullbacks, direct limits, and deformations, Picard groups, Newton polygons, and abelian groups.

**Function spaces: the second conference.** — Proceedings of the conference at Edwardsville. — Edited by Krzysztof Jarosz. — Lecture notes in pure and applied mathematics, vol. 172. — Un vol. broché,  $17,5 \times 25,5$ , de XI, 389 p. — Prix: US\$165.00. — Marcel Dekker, New York, 1995.

Detailing known results and latest discoveries in a wide range of topics concerning function spaces, this book presents the proceedings of the Second Conference on Function Spaces held

recently at Southern Illinois University. It covers advances in areas such as spaces and algebras of analytic functions,  $L_p$ -spaces, spaces of Banach-valued functions, isometries of function spaces, geometry of Banach spaces, and Banach algebras.

**Continua: with the Houston Problem Book.** — Edited by Howard Cook, W.T. Ingram, K.T. Kuperberg, Andrew Lelek, Piotr Minc. — Lecture notes in pure and applied mathematics, vol. 170. — Un vol. broché,  $17,5 \times 25,5$ , de VIII, 402 p. — Prix: US\$ 145.00. — Marcel Dekker, New York, 1995.

Featuring the Houston Problem Book (a collection of over 200 never before published problems accumulated over several years at the University of Houston and frequently used by continuum theorists), this practical reference provides a thorough overview of the most important areas of the subject including continua in real and complex dynamical systems, indecomposable continua, attractors, Menger manifolds, homogeneity, fixed points,  $k$ -to-1 functions, inverse limits on  $[0,1]$ , expansive homeomorphisms, etc.

Vladimir E. NAZAIKINSKII, Victor E. SHATALOV, Boris Yu. STERNIN. — **Methods of noncommutative analysis: theory and applications.** — De Gruyter studies in mathematics, vol. 22. — Un vol. relié,  $17 \times 24$ , de x, 373 p. — Prix: DM 198.00. — Walter de Gruyter, Berlin, 1995.

This is a systematic and self-contained introduction to noncommutative analysis, that is, the calculus of functions of noncommuting operators. This method originated in the classical works by R. Feynman and was developed further mainly by the Russian mathematical school led by Victor Maslov. The level is beginning graduate; results and concepts from representation theory of Lie groups and Lie algebras as well as the theory of pseudodifferential operators and Fourier integral operators are included in an appendix.

Alexander BENDIKOV. — **Potential theory on infinite-dimensional Abelian groups.** — Translated from the Russian by Carol Regher. — De Gruyter studies in mathematics, vol. 21. — Un vol. relié,  $17 \times 24$ , de VI, 184 p. — Prix: DM 168.00. — Walter de Gruyter, Berlin, 1995.

Introduction. — Elements of potential theory. — Markov processes and harmonic structures. — Markov processes and harmonic structure on a group. — Elliptic equations on a group. — Special classes of harmonic functions and potentials. — Some thoughts on probability and analysis on locally compact groups.

**Groups - Korea '94.** — Proceedings of the International Conference held at Pusan National University, Pusan, Korea, August 18-25, 1994. — Edited by A.C. Kim and D.L. Johnson. — Un vol. relié,  $17 \times 24$ , de IX, 344 p. — Prix: DM 198.00. — Walter de Gruyter, Berlin, 1995.

These proceedings include selected and refereed original papers. — From the contents: M.J. Dunwoody: Cyclic presentations and 3-manifolds. — D.L. Johnson, A.C. Kim and H.J. Song: The growth of the trefoil group. — Walter D. Neumann: Kleinian groups generated by rotations. — A.Yu. Ol'shanskii: A simplification of Golod's example. — John R. Stallings: Generic elements in certain groups. Geometric understanding of the angle between subgroups.

Ryszard ENGELKING. — **Theory of dimensions: finite and infinite.** — Sigma series in pure mathematics, vol. 10. — Un vol. relié,  $18 \times 24,5$ , de VIII, 401 p. — Prix: DM 148.00. — Heldermann Verlag, Lemgo, Germany, 1995.

Although building upon a previous publication this is in fact a new book. The classical results in dimension theory are followed by three chapters devoted to infinite-dimensional

spaces. This is a rather new field, which has evolved however during the last 20 years into a most interesting theory presented here for the first time in concise and unified form.

**Lattice theory and its applications: in celebration of Garrett Birkhoff's 80th birthday.** — Edited by K.A. Baker and R. Wille. — Research and expositions in mathematics, vol. 23. — Un vol. broché,  $17 \times 24$ , de 262 p. — Prix: DM 82.00. — Heldermann Verlag, Lemgo, Germany, 1995.

The fifteen articles in this volume are elaborations of selected lectures by leading experts at the Symposium on Lattice Theory and its Applications, held at the Technische Hochschule Darmstadt in 1991. The contributions survey pure and applied lattice theory and contain substantial new results.

**General algebra and discrete mathematics.** — Edited by K. Denecke and O. Lüders. — Research and exposition in mathematics, vol. 21. — Un vol. broché,  $17 \times 24$ , de 271 p. — Prix: DM 72.00. — Heldermann Verlag, Lemgo, Germany, 1995.

This volume contains articles based on lectures given at the Fourth Conference on Discrete Mathematics which took place at Postdam in 1993. The articles put in evidence some aspects of the natural interaction between general algebra and discrete mathematics. Algebraic structures such as semigroups, lattices, Boolean algebras, function algebras, and relation algebras, or ordered algebraic structures, form a structural background of certain fields of discrete mathematics such as formal languages, the theory of automata, theoretical computer science, and graph theory.

Andrew du PLESSIS and Terry WALL. — **The geometry of topological stability.** — London Mathematical Society monographs, New series, vol. 9. — Un vol. relié,  $16,5 \times 24$ , de VIII, 572 p. — Prix: £ 75.00. — Clarendon Press, Oxford, 1995.

The aim of the book is to give necessary and sufficient conditions for a  $C^\infty$  map to be  $C^0$ -stable: the aim is achieved in a wide range of dimensions via a detailed study of the geometry and topology of many classes of "generic singularities". The book describes original research, and the methods developed will stimulate future progress from their application, especially with regard to singularity theory.

Shahn MAJID. — **Foundations of quantum group theory.** — Un vol. relié,  $18 \times 25$ , de XIX, 607 p. — Prix: £ 65.00. — Cambridge University Press, Cambridge, 1995.

This is a graduate level text for theoretical physicists and mathematicians which systematically lays out the foundations for the subject of quantum groups in a clear and accessible way. After giving formal definitions and basic theory, the book goes on to cover such topics as quantum enveloping algebras, matrix quantum groups, combinatorics, cross products of various kinds, the quantum double, the semiclassical theory of Poisson-Lie groups and the representation theory.

**Invariant methods in discrete and computational geometry.** — Proceedings of the Curaçao Conference, 13-17 June, 1994. — Edited by Neil L. White. — Un vol. relié,  $16 \times 24,5$ , de XIII, 328 p. — Prix: Dfl. 240.00. — Kluwer Academic Publishers, Dordrecht, 1995.

These proceedings provides a basic introduction to several aspects of invariant theory, including the supersymmetric algebra, the Grassmann-Cayley algebra, and Chow forms. It also presents a number of current research papers on invariant theory and its applications to problems in geometry, such as automated theorem-proving and computer vision.



**Semigroups, formal languages and groups.** — Edited by John Fountain. — NATO ASI series, Series C: mathematical and physical sciences, vol. 466. — Un vol. relié, 16,5×24,5, de ix, 428 p. — Prix. Dfl. 285.00. — Kluwer Academic Publishers, Dordrecht, 1995.

The book contains articles that provide introductory accounts of recent research in rational languages and their connections with finite semigroups, including the celebrated BG=PG theorem, infinite languages, free profinite monoids and their applications to pseudovarieties, parallel complexity classes related to automata, etc. There is also an extensive survey of algorithmic problems in groups, semigroups and inverse monoids.

Howard ANTON. — **Multivariable calculus.** — In collaboration with Albert Herr. — Fifth edition. — Un vol. broché, 21,5×26, de xxiii, 434 p. — Prix: £24.95. — John Wiley, New York, 1995.

This book consists of the multivariable portion of Howard Anton's text "Calculus with analytic geometry", 5th edition (Chapters 14-18), as well as Chapter 19 on second-order differential equations. Also included are: the chapter on infinite series (Chapter 11), the section on first-order differential equations (Section 7.7), the appendix on Cramer's rule (Appendix D), and the appendix on complex numbers (Appendix E).

**Control problems in industry.** — Proceedings from the SIAM Symposium on Control problems, San Diego, California, July 22-23, 1994. — Edited by Irena Lasiecka and Blaise Morton. — Progress in systems and control theory, vol. 21. — Un vol. relié, 16×24, de xiv, 349 p. — Prix: SFr. 148.00. — Birkhäuser, Boston, 1995.

The purpose of this volume is to provide a survey of control theory applications at the frontiers of today's technology. The articles were selected primarily for the practical significance of the problem solved, though all had significant mathematical components. At present there is a wealth of control theoretic results, including new models, new constructions, and new algorithms, leading to new and implementable solutions to industrial problems.. The aim of the papers is to present these new results.

J.J. DUISTERMAAT. — **Fourier integral operators.** — Progress in mathematics, vol. 130. — Un vol. relié, 16×24, de viii, 142 p. — Prix: SFr. 58.00. — Birkhäuser, Boston, 1995.

This volume is a useful introduction to the subject of Fourier integral operators and is based on the author's classic set of notes. Covering a range of topics from Hoermander's exposition of the theory, Duistermaat approaches the subject from symplectic geometry and includes applications to hyperbolic equations (=equations of wave type) and oscillatory asymptotic solutions which may have caustics.

**Fractal geometry and stochastics.** — Edited by Christoph Bandt, Siegfried Graf, Martina Zähle. — Progress in probability, vol. 37. — Un vol. relié, 16×24, de xi, 245 p. — Prix: SFr. 98.00. — Birkhäuser, Basel, 1995.

The contributors of this book were the main speakers attending the conference "Fractal geometry and stochastics" held at Finsterbergen, Germany, in June 1994. The book is addressed to mathematicians and other scientists who are interested in the mathematical theory concerning: fractal sets and measures, iterated function systems, random fractals, fractals and dynamical systems, and harmonic analysis on fractals.

**Proceedings of the International Congress of Mathematicians (ICM), Zürich 1994.** — Edited by S.D. Chatterji. — Deux vol. reliés, 17,5×24, de 1676 p. — Prix: SFr. 298.00. — Birkhäuser, Basel, 1995.

Volume 1 of the Proceedings contains an account of the organization of the Congress, the list of ordinary members, the reports on the work of the Fields medalists and the Nevanlinna Prize Winner, the plenary one-hour addresses, and the invited addresses presented at Section Meetings 1-6. Volume 2 contains the invited addresses for Section Meetings 7-19. — Invited one-hour plenary addresses: J. Bourgain: Harmonic analysis and nonlinear partial differential equations. — J.H. Conway: Sphere packings, lattices, codes, and greed. — I. Daubechies: Wavelets and other phase space localization methods. — J. Froehlich: The fractional quantum Hall effect, Chern-Simons theory, and integral lattices. — J.B. Keller: Wave propagation. — M. Kontsevich: Homological algebra of mirror symmetry. — P.-L. Lions: On some recent methods for nonlinear partial differential equations. — M. Ratner: Interactions between ergodic theory, Lie groups and number theory. — P. Seymour: Progress on the four-colour theorem. — S.R.S. Varadhan: Entropy methods in hydrodynamic scaling. — V.A. Vassiliev: Topology of discriminants and their complements. — D. Voiculescu: Free probability theory: random matrices and von Neumann algebras. — A. Wiles: Modular forms, elliptic curves and Fermat's last theorem. — J.-C. Yoccoz: Recent developments in dynamics.

Daniel JUSTENS, Jacqueline ROSOUX. — **Introduction à la mathématique financière.** — 200 exercices résolus, 50 cas réels différents traités en détail. — Collection «Entreprise». — Troisième édition. — Un vol. broché, 16×24, de 444 p. Prix: FBE 1450.00. — De Boeck Université, Bruxelles, diffusé en Suisse par GM Diffusion, Lonay, 1995.

Cet ouvrage est conçu comme un outil pratique permettant le calcul du taux d'intérêt réel d'un contrat quelconque et facilement adaptable à toute nouvelle forme de contrat. La méthode proposée, quoique élémentaire, s'adapte sans difficulté aux cas les plus délicats et convient également pour tous les problèmes de calcul de rentabilité d'investissement.

Camille DEBIEVE, Yves FELIX. — **Analyse infinitésimale: pour HEC et ingénieurs commerciaux.** — Collection «Bibliothèque des Universités. Mathématiques». — Un vol. broché, 18×25, de 240 p. — Prix: FBE 720.00. — De Boeck Université, Bruxelles, diffusé en Suisse par GM Diffusion, Lonay, 1995.

Alliant rigueur et précision, le présent ouvrage expose les résultats fondamentaux de la théorie: la complétude de la droite réelle et les propriétés des fonctions continues, l'étude des graphes de fonctions d'une variable, en particulier le concept de dérivabilité et ses implications économiques, le lien entre l'opération algébrique de primitivation et l'opération géométrique d'intégration, une première vision des fonctions de deux variables, les rudiments de calcul des intégrables doubles.

George R. KEMPF. — **Algebraic structures.** — Textbook Mathematics. — Un vol. broché, 16×23, de x, 165 p. — Prix: DM 42.00. — Friedr. Vieweg & Sohn, Braunschweig/Wiesbaden, 1995.

Intended as an introductory text for a course in algebra at the graduate level, this book provides a very concise but extremely effective and comprehensive approach to the subject. Apart from the basics on groups, rings, fields, and modules, the book offers many important topics in Galois theory, multilinear algebra, representation theory of groups, ring and field extensions, commutative and local algebra, homological algebra, Lie algebras, Clifford algebras, and the theory of categories and functors.

Michel WILLEM. — **Analyse harmonique réelle.** — Collection «Méthodes». — Un vol. broché, 15×22, de 235 p. — Prix: FF 150.00. — Hermann, Paris, 1995.

Cet ouvrage suppose connus le calcul différentiel, l'algèbre linéaire et l'intégrale de Riemann. Il traite de l'analyse de Fourier, introduite sur des espaces de fonctions régulières, étendue aux espaces de Lebesgue par densité et aux espaces de distributions par dualité. L'analyse fonctionnelle y est traitée de manière succincte, ainsi que l'intégrale de Lebesgue, dont une présentation nouvelle conduit directement aux théorèmes de complétude et de densité.

Miles REID. — **Undergraduate commutative algebra.** — London Mathematical Society student text, vol. 29. — Un vol. broché,  $15 \times 23$ , de XIII, 152 p. — Prix: £ 11.95. — Cambridge University Press, Cambridge, 1995.

Alongside standard algebraic notions such as generators of modules and the ascending chain condition, the book develops in detail the geometric view of a commutative ring as the ring of functions on a space. The starting point is the Nullstellensatz, which provides a close link between the geometry of a variety  $V$  and the algebra of its co-ordinate ring  $A=k[V]$ . The final chapter includes an account of some famous "pathological" examples of Akizuki and Nagata, and a brief but thought-provoking essay on the changing position of abstract algebra in today's world.

**Computability, enumerability, unsolvability: directions in recursion theory.** — Edited by S.B. Cooper, T.A. Slaman, S.S. Wainer. — London Mathematical Society lecture note series, vol. 224. — Un vol. broché,  $15 \times 23$ , de VII, 347 p. — Cambridge University Press, Cambridge, 1996.

The contributions in this book, by leaders in the field, provide a picture of current ideas and methods in the ongoing investigations into the pure mathematical foundations of computability theory. The topics range over computable functions, enumerable sets, degree structures, complexity, subrecursiveness, domains and inductive inference.

Kazuaki TAIRA. — **Analytic semigroups and semilinear initial boundary value problems.** — London Mathematical Society lecture note series, vol. 223. — Un vol. broché,  $15 \times 23$ , de X, 164 p. — Prix: £ 20.95 — Cambridge University Press, Cambridge, 1995.

This book provides an exposition of the function analytic approach to initial boundary value problems for semilinear parabolic differential equations. It focuses on the relationship between two interrelated subjects in analysis: analytic semigroups and initial boundary value problems. This semigroup approach can be traced back to the pioneering work of Fujita and Kato on the Navier-Stokes equation.

J.T. WLOKA, B. ROWLEY, B. LAWLUK. — **Boundary value problems for elliptic systems.** — Un vol. relié,  $16 \times 23,5$ , de XIV, 641 p. — Prix: £ 60.00. — Cambridge University Press, Cambridge, 1995.

This book examines the theory of boundary value problems for elliptic systems of partial differential equations, a theory which has many applications in mathematics and the physical sciences. The aim is to simplify and to algebraize the index theory by means of pseudo-differential operators and new methods in the spectral theory of matrix polynomials. This book is suitable for use in graduate level courses on partial differential equations, elliptic systems, pseudo-differential operators, and matrix analysis.

**Combinatorics advances.** — Edited by Charles J. Colbourn and Ebadollah S. Mahmoodian. — Mathematics and its applications, vol. 329. — Un vol. relié,  $16,5 \times 25$ , de XV, 324 p. — Prix: Dfl. 240.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book is a collection of nineteen surveys and research papers presented at the 25th Annual Iranian Conference in Teheran. Keynote papers by Richard Guy and Andreas Dress on combinatorics, combinatorial games, molecular biology, and tilings are complemented by invited survey papers in combinatorial design theory and graph theory, and by contributed papers covering graphs, designs, and related combinatorics.

Alexander I. STEPANETS. — **Classification and approximation of periodic functions.** — Mathematics and its applications, vol. 333. — Un vol. relié, 16,5×25, de x, 360 p. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This monograph proposes a new classification of periodic functions, based on the concept of generalized derivative, defined by introducing multipliers and shifts of the argument into the Fourier series of the original function. This approach permits the classification of a wide range of functions, including those of which the Fourier series may diverge in integral metric, smooth functions, and infinitely differentiable functions, including analytical and entire ones.

Calin-Grigore AMBROZIE, Florian-Horia VASILESCU. — **Banach space complexes.** — Mathematics and its applications, vol. 334. — Un vol. relié, 16,5×25, de 202 p. — Prix: Dfl. 160.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book offers a systematic approach to the study of those properties of Banach space complexes that are stable under certain perturbations. The stability of the index under small or compact perturbations is presented within the context of (semi-) Fredholm complexes. Various invariants and other properties are also considered. This raises certain problems requiring further study of more general Fredholm-type objects.

Boris S. STECHKIN and Valeriy I. BARANOV. — **Extremal combinatorial problems and their applications.** — Mathematics and its applications, vol. 335. — Un vol. relié, 17×25, de xiv, 205 p. — Prix: Dfl. 160.00. — Kluwer Academic Publishers, Dordrecht, 1995.

The last few decades have seen a vigorous development of combinatorial research in Russia based both on translated Western sources and original Russian material. The purpose of this volume is to extend the extremal approach to solving a large class of problems including some previously regarded as exclusively algorithmic and to broaden the choice of theoretical bases for modelling real phenomena in order to solve practical problems.

**Near-rings and near-fields.** — Proceedings of the Conference on Near-Rings and Near-Fields, Fredericton, New Brunswick, Canada, July 18-24, 1993. — Edited by Yuen Fong, Howard E. Bell, Wen-Fong Ke, Gordon Mason and Guenter Pilz. — Mathematics and its applications, vol. 336. — Un vol. relié, 17×25, de ix, 278 p. — Prix: Dfl. 210.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This proceedings volume opens with three invited lectures concerning different aspects of the history of near-ring theory. They are followed by twenty-six papers reflecting the diversity of the subject of near-rings, with respect to geometry, topological groups, automata, coding theory and probability as well as the purely algebraic structure theory of near-rings.

John SCHMEELK, Djurdjica TAKACI and Arpad TAKACI. — **Elementary analysis through examples and exercises.** — Kluwer texts in mathematical sciences, vol. 10. — Un vol. relié, 17×25, de ix, 319 p. — Prix: Dfl. 210.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This volume on mathematical analysis offers a comprehensive set of both traditional and new examples and exercises with detailed solutions. It includes many topics important in current

research as, for instance a comparison of real numbers viewed as a totally ordered field or alternatively constructed using the Dedekind cut method. Properties surrounding real numbers are explored and many interesting relationships are proven using mathematical induction.

Reiner HORST, Panos M. PARDALOS and Nguyen V. THOAI. — **Introduction to global optimization.** — Nonconvex optimization and its applications, vol. 3. — Un vol. relié, de XII, 318 p. — Prix: Dfl. 235.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This is a comprehensive textbook that covers the fundamentals in global optimization and presents much new material. The book includes algorithms, applications, and complexity results for quadratic programming, concave minimization, DC and Lipschitz problems, and nonlinear network flow problems. Each chapter contains illustrative examples and selected exercises.

**Topological methods in differential equations and inclusions.** — Edited by Andrzej Granas and Marlène Frigon, technical editor Gert Sabidussi. — NATO ASI series, Series C: Mathematical and physical sciences, vol. 472. — Un vol. relié, 16,5×24,5, de xv, 522 p. — Prix: Dfl. 355.00. — Kluwer Academic Publishers, Dordrecht, 1995.

The main topics covered in this book, which contains the proceedings of the NATO ASI held in Montreal, are: non-smooth critical point theory, second order differential equations on manifolds and forced oscillations, topological approach to differential inclusions, periodicity of singularly perturbed delay equations, existence, multiplicity and bifurcation of solutions of non-linear boundary value problems, some applications of the topological degree to stability theory, bifurcation problems for semilinear elliptic equations, etc.

**Finite and locally finite groups.** — Edited by B. Hartley, G.M. Seitz, A.V. Borovik, R.M. Bryant. — NATO ASI series, Series C: Mathematical and physical sciences, vol. 471. — Un vol. relié, 16×24,5, de XII, 458 p. — Prix: Dfl. 315.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book provides an extensive introduction to recent progress in the theory of locally finite groups, algebraic groups, and finite groups of Lie type. Fifteen specialists in the field have written survey articles covering the major themes of the subject, such as the theory of simple locally finite groups and the theory of finitary linear groups. The articles are based on lectures given at the highly successful NATO ASI held in Istanbul in August 1994 and organized by the late Brian Hartley.

Armen H. ZEMANIAN. — **Transfiniteness for graphs, electrical networks, and random walks.** — Un vol. relié, 16×24, de x, 246 p. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1996.

Despite the century-old introduction of transfiniteness into mathematics, its implications for graphs have only been examined during the past decade. This book is devoted exclusively to transfinite graphs and their ramifications for several related topics, such as electrical networks, discrete potential theory, and random walks. Transfiniteness introduces radically new constructs and expands graphs and their related topics far beyond their conventional domains.

Forman S. ACTON. — **REAL computing made real: preventing errors in scientific and engineering calculation.** — Un vol. relié, 16×24, de xv, 259 p. — Prix: US\$29.95. — Princeton University Press, Princeton, 1996.

Offering practical advice on detecting and removing the insidious bugs that plague finite-precision calculations, this book outlines techniques for preserving significant figures, avoiding



extraneous solutions (those ridiculous “answers” that turn up too often), and finding efficient iterative processes for solving nonlinear equations. The book presents a wealth of examples and exercises (with answers) to help a reader develop problem formulating skills — thus learning to avoid the common pitfalls that software packages seldom detect.

Iain T. ADAMSON. — **A general topology workbook.** — Un vol. broché,  $15 \times 23,5$ , de VIII, 152 p. — Prix: SFr. 42.00. — Birkhäuser, Boston, 1995.

The book presents elementary general topology in an unconventional way. Part one of the book gives a quick review of the basic definitions of the subject, interspersed with a large number of exercises, some of which are described as theorems. Part one is a valuable reference completely on its own. Part two contains complete solutions and complete proofs.

Geir E. DULLERUD. — **Control of uncertain sampled-data systems.** — Systems & control. — Un vol. broché,  $16 \times 24$ , de XIV, 177 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1996.

The author's goal in this book is to provide a detailed treatment of uncertainty analysis for sampled-data hybrid systems in the context of robust control theory. In the body of the text, operator theoretic tools and techniques are developed to address the central design issues of performance and stabilization in the presence of structured uncertainty classes. The material of the book is of both theoretical and engineering interest.

Jan KRAJICEK. — **Bounded arithmetic, propositional logic, and complexity theory.** — Encyclopedia of mathematics and its applications, vol. 60. — Un vol. relié,  $16 \times 24$ , de XIV, 343 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1995.

This book presents an up-to-date, unified treatment of research in bounded arithmetic and complexity of propositional logic with emphasis on independence proofs and lower bound proofs. The author discusses the deep connections between logic and complexity theory and lists a number of intriguing open problems. Some of the topics treated: polynomial simulations and conservativity results, various witnessing theorems, the translation of bounded formulas (and their proofs) into propositional ones, the method of random partial restrictions and its applications, etc.

**Kaleidoscopes: selected writings of H.S.M. Coxeter.** — Edited by F.A. Sherk, P. McMullen, A.C. Thompson, A.I. Weiss. — Published in conjunction with the Fiftieth Anniversary of the Canadian Mathematical Society. — Canadian Mathematical Society series of monographs and advanced texts. — A Wiley Interscience publication. — Un vol. relié,  $18 \times 26$ , de xxx, 439 p. — Prix: £70.00. — J. Wiley and Sons, New York, 1995.

The work of H.S.M. Coxeter on groups generated by reflections spans sixty years of creative activity and is acknowledged by mathematicians to be of major importance in the theory of discrete groups. This collection of twenty-six papers contains a full account of Coxeter's contribution to the area. The papers are thematically arranged and the introduction to the papers is an excellent guide to the particular topics that are addressed.

**Categorical structure of closure operators: with applications to topology, algebra and discrete mathematics.** Edited by D. Dikranjan and W. Tholen. — Mathematics and its applications, vol. 346. — Un vol. relié,  $16 \times 25$ , de xvii, 356 p. — Prix: Dfl. 255.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book provides a comprehensive categorical theory of closure operators, with applications to topological and uniform spaces, groups,  $R$ -modules, fields and topological groups, as well as partially ordered sets and graphs. In particular, closure operators are used to give solutions to the epimorphism and co-well-poweredness problem in many concrete categories.

D.S. MITRINOVIC, J. SANDOR, in cooperation with B. CRSTICI. — **Handbook of number theory.** — Mathematics and its applications, vol. 351. — Un vol. relié,  $16,5 \times 24,5$ , de XXVI, 622 p. — Prix: Dfl. 395.00. — Kluwer Academic Publishers, Dordrecht, 1996.

This handbook covers a wealth of topics from number theory, with special attention being given to estimates and inequalities. As a rule, the most important results are presented, together with their refinements, extensions or generalizations. These may be applied to other aspects of number theory, or to a wide range of mathematical disciplines. Cross-references provide new insight into fundamental research.

**Abelian groups and modules.** — Proceedings of the Padova conference, Padova, Italy, June 23-July 1, 1994. — Edited by Alberto Facchini and Claudia Menini. — Mathematics and its applications, vol. 343. — Un vol. relié,  $17 \times 24,5$ , de xx, 517 p. — Prix: Dfl. 340.00. — Kluwer Academic Publishers, Dordrecht, 1995.

Linking three main areas in algebra, namely abelian groups, commutative algebra, and modules over non-commutative rings, this volume gives an excellent overview of current trends as well as state-of-the-art results in specific topics of research. Subject covered include: representation theory, Hopf modules, Krull dimension, dualities, finitistic dimension, algebraically compact modules, Von Neumann regular rings, serial rings, reflexive algebras, endomorphism rings, Butler groups, torsion free abelian groups, and totally projective groups.

Nikolai N. TARKHANOV. — **Complexes of differential operators.** — Mathematics and its applications, vol. 340. — Un vol. relié,  $17 \times 24,5$ , de XVIII, 396 p. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book gives a systematic account of complexes of differential operators on differentiable manifolds. The main topic is the study of general complexes of differential operators between sections of vector bundles. All the recent developments in the theory of complexes of differential operators are dealt with to some degree: formal theory, existence theory, global solvability problem, overdetermined boundary problems, etc.

Sergei A. AVDONIN, Sergei A. IVANOV. — **Families of exponentials: the method of moments in controllability problems for distributed parameter systems.** — Un vol. relié,  $16 \times 24$ , de xv, 302 p. — Prix: £35.00. — Cambridge University Press, Cambridge, 1995.

This book presents the newly developed theory of nonharmonic Fourier series and its applications to the control of distributed parameter systems. The authors extend the theory to include vector exponential series. The first part of the book presents the modern theory of nonharmonic Fourier series based on the geometry of Hilbert spaces. This approach permits the successful development of the theory of scalar exponential families and vector exponential families. The development of this mathematical apparatus paves the way for the second part of the book, which extends and upgrades the method of moments.

**Modern methods in complex analysis.** — The Princeton Conference in honor of Gunning and Kohn. — Edited by T. Bloom, D. Catlin, J.P. D'Angelo, Yum-Tong Siu. — Annals of mathematics studies, vol. 137. — Un vol. broché,  $15,5 \times 23,5$ , de xiv, 342 p. — Prix: US\$35.00, relié US\$75.00. — Princeton University Press, Princeton, New Jersey, 1996.

The fifteen articles composing this volume focus on recent developments in complex analysis. They cover a wide spectrum of research using the methods of partial differential equations as well as differential and algebraic geometry. The topics include invariants of manifolds, the complex Neumann problem, complex dynamics, Ricci flows, the Abel-Radon transforms, the action of the Ricci curvature operator, locally symmetric manifolds, the maximum principle, very ampleness criterion, integrability of elliptic systems, and contact geometry.

Nicholas M. KATZ. — **Rigid local systems.** — Annals of mathematics studies, vol. 139. — Un vol. broché,  $15,5 \times 23,5$ , de VII, 217 p. — Prix: US\$22.50 (relié: US\$49.50). — Princeton University Press, Princeton, New Jersey, 1996.

This book is devoted to constructing all (irreducible) rigid local systems on  $\mathbf{P}^1$  — (a finite set of points) and recognizing which collections of independently given local monodromies arise as the local monodromies of irreducible rigid local systems. Although the problems addressed here go back to Riemann, and seem to be problems in complex analysis, their solutions depend essentially on a great deal of very recent arithmetic algebraic geometry.

**Prospects in topology.** — Proceedings of a Conference in honor of William Browder. — Edited by Frank Quinn. — Annals of Mathematics studies, vol. 138. — Un vol. broché,  $15,5 \times 23,5$ , de VI, 340 p. — Prix: US\$29.95 (relié: US\$65.00). — Princeton University Press, Princeton, New Jersey, 1996.

This collection brings together influential papers by mathematicians exploring the research frontiers of topology. The papers cover a wide range of topological specialties, including tools for the analysis of group actions on manifolds, calculations of algebraic  $K$ -theory, a result on analytic structures on Lie groups actions, a presentation of the significance of Dirac operators in smoothing theory, an answer to the famous question about symmetries of simply connected manifolds, and a fresh perspective on the topological classification of linear transformations.

John W. MORGAN. — **The Seiberg-Witten equations and applications to the topology of smooth four-manifolds.** — Mathematical notes, vol. 44. — Un vol. broché,  $15,5 \times 23,5$ , de VI, 128 p. — Prix: US\$19.95. — Princeton University Press, Princeton, New Jersey, 1996.

The recent introduction of the Seiberg-Witten invariants of smooth four-manifolds has revolutionized the study of those manifolds. The invariants are gauge-theoretic in nature and are close cousins of the much-studied  $SU(2)$ -invariants defined over fifteen years ago by Donaldson. On a practical level, the new invariants have proved to be more powerful and have led to a vast generalization of earlier results. This book is an introduction to the Seiberg-Witten invariants.

J. Scott CARTER, Daniel E. FLATH and Masahico SAITO. — **The classical and quantum  $6j$ -symbols.** — Mathematical notes, vol. 43. — Un vol. broché,  $15,5 \times 23,5$ , de IX, 164 p. — Prix: US\$22.50. — Princeton University Press, Princeton, New Jersey, 1996.

Addressing physicists and mathematicians alike, this book discusses the finite dimensional representation theory of  $sl(2)$ , both classical and quantum. Covering representations of  $U(sl(2))$ , quantum  $sl(2)$ , the quantum trace and color representations, and the Turaev-Viro invariant, this work is useful to graduate students and professionals.

Richard P. STANLEY. — **Combinatorics and commutative algebra.** — Second edition. — Progress in mathematics, vol. 41. — Un vol. relié,  $16 \times 24$ , de VI, 164 p. — Prix: SFr. 58.00. — Birkhäuser, Boston, 1996.



This book provides an overview of two of the main topics in this area. The first concerns the solutions of linear equations in nonnegative integers. The second topic deals with the face ring of a simplicial complex and includes a proof of the upper bound conjecture for spheres. New to this edition is a chapter surveying recent work related to face rings, focusing on applications to  $f$ -vectors. Included is an outline of the proof of McMullen's  $g$ -conjecture for simplicial polytopes based on toric varieties, as well as a discussion of the face rings of special classes of simplicial complexes.

**New developments in differential geometry.** — Proceedings of the Colloquium on Differential Geometry, Debrecen, Hungary, July 26-30, 1994. — Edited by L. Tamassy and J. Szenthe. — Mathematics and its applications, vol. 350. — Un vol. relié, 17×24,5, de x, 434 p. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1996.

This volume contains 36 research articles presented at the Colloquium. The main topics are Riemannian geometry, Finsler geometry, submanifold theory and applications to theoretical physics. Some new results are included, e.g. on non-commutative geometry, spin bordism groups, Cosserat continuum, field theories, second order differential equations, sprays, natural operators, higher order frame bundles, Sasakian and Kähler manifolds.

M.M. RAO. — **Stochastic processes: general theory.** — Mathematics and its applications, vol. 342. — Un vol. relié, 17×24,5, de xii, 623 p. — Prix: Dfl. 360.00. — Kluwer Academic Publishers, Dordrecht, 1996.

The book is a completely revised and enlarged version of the author's *Stochastic Processes and Integration* (Noordhoff, 1979). — Contents: Introduction and foundations. Conditioning and martingales. Stochastic function theory. Refinements in martingale analysis. Martingale decompositions and integration. Stochastic integrals and differential systems. Stochastic analysis on differential structures. — Each of the seven chapters includes complements, exercises and extensive references.

**Handbook of combinatorics.** — Edited by R.L. Graham, M. Groetschel, L. Lovasz. — 2 vol. reliés, 17×24,5, de 2404 p. — Prix: Dfl. 240.00 (vol.1), Dfl. 240.00 (vol. 2), Dfl. 480.00 (vol.1 et 2). — North-Holland, Amsterdam, 1995.

The intense interest in combinatorics has been fuelled in large part by the increasing importance of computers, the needs of computer science and the demands from applications where discrete models play more and more important roles. In addition, many classical branches of mathematics have now come to recognize that combinatorial structures are essential components of many mathematical theories. Leading experts in all areas of combinatorics have contributed to this book. It provides the working mathematician and computer scientist with an excellent overview of basic methods and paradigms. The book also covers important results and discusses current trends and issues across the whole spectrum of combinatorics. It is hoped that even specialists in the field will benefit from reading this handbook by learning a leading expert's coherent and individual view of the topic.

George GRÄTZER. — **Math into LATEX: an introduction to LATEX and AMS-LATEX.** — Un vol. broché, 18,5×23,5, de xxvii, 451 p. — Prix: SFr. 78.00. — Birkhäuser, Boston, 1996.

The book provides the beginner with a simple, direct approach. Using numerous examples, a formula gallery, sample files, and templates, a short course, Part I, guides the reader through typing text, math formulas, equations, and an article template making it possible to start typing

an article with only a few hours of his time. The rest of this book provides a systematic discussion of all aspects of LATEX and the AMS packages, customization, and introduces two major tools to help compile long bibliographies and indexes. There are also seven appendixes containing symbol tables and discussing special topics such as the use of Postscript fonts.

Hugo F. VERHEYEN. — **Symmetry orbits.** — Design science collection. — Un vol. relié,  $18,5 \times 22,5$ , de VI, 236 p. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1996.

The author of this book has beautifully illustrated active symmetry through the observation of the orbit of a plain cube as it creates an arrangement of cube replicas with overall symmetry under such a specific group. In the detailed study of the cube's orbits, a complete enumeration of cube compounds is introduced and illustrated by photographs, patterns, and constructable models. The mathematician, scientific investigator, or student will welcome further a full description of all finite symmetry groups with relevant drawings, calculations, and data.

Malcolm ADAMS, Victor GUILLEMIN. — **Measure theory and probability.** — Un vol. relié,  $16 \times 24$ , de XIV, 205 p. — Prix: SFr. 42.00. — Birkhäuser, Boston, 1996.

Measure theory and integration are presented to undergraduates from the perspective of probability theory. The first chapter shows why measure theory is needed for the formulation of problems in probability. The measure-theoretic approach leads to interesting applications and a range of topics as the construction of the Lebesgue measure on  $R^n$  (metric space approach). Chapter 3 expands on abstract Fourier analysis, Fourier series and the Fourier integral, etc.

Gerd GRUBB. — **Functional calculus of pseudodifferential boundary problems.** — Second edition. — Progress in mathematics, vol. 65. — Prix: SFr. 138.00. — Birkhäuser, Boston, 1996.

The main purpose of this book is to set up an operational calculus for operators defined from differential and pseudodifferential boundary value problems via a resolvent construction. In this second edition, the author has extended the scope and applicability of the calculus with original contributions and perspectives developed in the recent years. A main improvement is the inclusion of globally estimated symbols, allowing a treatment of operators on noncompact manifolds.

Philip J. DAVIS, Reuben HERSH, Elena Anne MARCHISOTTO. — **The companion guide to The Mathematical Experience.** — Study edition. — Un vol. broché,  $15 \times 23$ , de VI, 120 p. — Prix: SFr. 24.00. — Birkhäuser, Boston, 1995.

The major purpose of the book is to enhance the value of *The Mathematical Experience, Study edition* as a textbook for the teachers and to provide content and method for prospective teachers. *The Companion Guide* is rich in suggestions for classroom discussion topics. Each is linked to a chapter of the textbook and to the central idea of learning how to think, talk, and write ABOUT mathematics while learning how to DO mathematics.

Harald UPMEIER. — **Toeplitz operators and index theory in several complex variables.** — Operator theory, vol. 81. — Un vol. relié,  $17 \times 24$ , de 490 p. — Prix: SFr. 168.00. — Birkhäuser, Basel, 1996.

This book gives a comprehensive treatment of Toeplitz operators arising in multivariable complex analysis. The first part describes in detail the underlying geometric structures (strongly

pseudoconvex domains, Reinhardt domains, multivariable upper half-planes, symmetric domains and generalizations) as well as the harmonic analysis of the associated Hilbert spaces of holomorphic functions (of Hardy or Bergman type). The second part of the book determines the structure of Toeplitz operators, their  $C^*$ -algebras and index theory, using modern techniques such as groupoid  $C^*$ -algebras, co-crossed products and operator  $K$ -theory.

Anatolij ANTONEVICH. — **Linear functional equations. Operator approach.** — Translated from the Russian by Victor Muzafarov and Andrei Iacob. — Operator theory, vol. 83. — Un vol. relié,  $17 \times 24$ , de VIII, 179 p. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1996.

This monograph presents a unified approach to the investigation of a general class of functional equations based on the examination of functional operators and Banach algebras generated by them, synthesizing methods involving dynamical systems, operator algebras and pseudo-differential operators. Special attention is paid to spectral properties of functional operators, and index formulas are derived.

**Functional analysis on the eve of the 21st century: in honor of the eightieth birthday of I.M. Gelfand.** — Edited by S. Gindikin, J. Lepowsky, R.L. Wilson. — Progress in mathematics, vol 131 et 132. — 2 vol. reliés,  $16 \times 24$ , de XXII, 292 et XXII, 323 p. respectivement. — Prix: SFr. 128.00, l'ensemble des deux volumes. — Birkhäuser, Boston, 1996.

The papers in these volumes largely concern areas in which Gelfand has a very strong interest today, including geometric quantum field theory, representation theory, combinatorial structures underlying various "continuous" constructions, quantum groups and geometry. — Contributors: **Vol. 1:** K. Aomoto, R. Brylinski and B. Konstant, I.B. Frenkel and V.G. Turaev, M. Kapranov and D. Kazhdan, M. Kontsevich and S. Vishik, G. Lusztig, O. Mathieu, C. Moeglin, I.M. Singer, E. Witten. **Vol. 2:** M. Gromov, M. Hanamura and R. MacPherson, L. Jeffrey and F.C. Kirwan, A. Klemm, G.H. Lian, S.S. Roan, S.T. Yau.

J.J. DUISTERMAAT. — **The heat kernel Lefschetz fixed point formula for the spin-c Dirac operator.** — Progress in nonlinear differential equations and their applications, vol. 18. — un vol. relié,  $17 \times 23$ , de VII, 247 p. — Prix: SFr. 58.00. — Birkhäuser, Boston, 1996.

Using the heat kernels theory of Berline, Getzler and Vergne, Duistermaat revisits some fundamental concepts of the theory, and presents the application to symplectic geometry. The presentation of the local formula provides an accessible approach for analysts, and is particularly suited for generalizing the Lefschetz formula to compact orbifolds. A large part of the book has a wider scope than spin-c Dirac. One of the chapters for example, gives the asymptotic expansion of heat kernels for the generalized Laplace operators.

P.A.M. DIRAC. — **General theory of relativity.** — Princeton landmarks in mathematics and physics. — Un vol. broché,  $15,5 \times 23,5$ , de VIII, 69 p. — Prix: US\$10.95. — Princeton University Press, Princeton, New Jersey, 1996.

Einstein's general theory of relativity requires a curved space for the description of the physical world. If one wishes to go beyond superficial discussions of the physical relations involved, one needs to set up precise equations for handling curved space. The well-established mathematical technique that accomplishes this is clearly described in this classic book.

A.R. EDMONDS. — **Angular momentum in quantum mechanics.** — Princeton landmarks in physics. — Un vol. broché,  $15,5 \times 23,5$ , de VIII, 146 p. — Prix: US\$13.95. — Princeton University press, Princeton, New Jersey, 1996.

This book offers a concise introduction to the angular momentum, one of the most fundamental quantities in all of quantum mechanics. Beginning with the quantization of angular momentum, spin angular momentum, and the orbital angular momentum, the author goes on to discuss the Clebsch-Gordan coefficients for a two-component system. Throughout, the author provides practical applications to atomic, molecular, and nuclear physics.

Abraham ROBINSON. — **Non-standard analysis.** — Revised edition. — Princeton landmarks in mathematics. — Un vol. broché,  $15,5 \times 23,5$ , de XIX, 293 p. — Prix: US\$19.95. — Princeton University Press, Princeton, New Jersey, 1996.

Considered by many to be Abraham Robinson's magnum opus, this book offers an explanation of the development and applications of non-standard analysis which grew out of Robinson's attempt to resolve the contradictions posed by infinitesimals within calculus. This paperback reprint of the 1974 revised edition is indispensable reading for anyone interested in non-standard analysis. It treats in rich detail many areas of application, including topology, functions of a real variable, functions of a complex variable, and normed linear spaces, together with problems of boundary layer flow of viscous fluids and rederivations of Saint-Venant's hypothesis concerning the distribution of stresses in an elastic body.

Christine LESCOP. — **Global surgery formula for the Casson-Walker invariant.** — Annals of mathematics studies, vol. 140. — Un vol. broché,  $16 \times 23,5$ , de 150 p. — Prix: US\$19.95. — Princeton University Press, Princeton, New Jersey, 1996.

This book presents a new result in 3-dimensional topology. It is well known that any closed oriented 3-manifold can be obtained by surgery on a framed link in  $S^3$ . Here, a function  $F$  of framed links in  $S^3$  is described, and it is proven that  $F$  consistently defines an invariant,  $\lambda$ , of close oriented 3-manifolds.  $\lambda$  is then expressed in terms of previously known invariants of 3-manifolds. For integral homology spheres,  $\lambda$  is the invariant introduced by Casson in 1985, which allowed him to solve old and famous questions in 3-dimensional topology.  $\lambda$  becomes simpler as the first Betti number increases.

Stephen HAWKING and Roger PENROSE. — **The nature of space and time.** — The Isaac Newton Institute series of lectures. — Un vol. relié,  $16,5 \times 24$ , de VIII, 141 p. — Prix: US\$24.95. — Princeton University Press, Princeton, New Jersey, 1996.

Can quantum and cosmos ever be combined? On this issue two of the world's most famous physicists — Stephen Hawking and Roger Penrose — disagree. Here they explain their positions in a work based on six lectures with a final debate, all originally presented at the Isaac Newton Institute for mathematical Sciences at the University of Cambridge.

**Surveys in differential geometry, vol. 2.** — Edited by C.C. Hsiung and S.-T. Yau. — Proceedings of the Conference on Geometry and Topology, held at Harvard University, April 23-25, 1993, sponsored by Lehigh University's Journal of Differential Geometry. — Un vol. relié,  $16 \times 23,5$ , de 456 p. — Prix: US\$32.00. — International Press, Cambridge MA, 1995.

M. Atiyah: Reflections on geometry and physics. — R.S. Hamilton: The formation of singularities in the Ricci flow. — H.B. Lawson, Jr.: Spaces of algebraic cycles. — Yu.I. Manin: Problems on rational points and rational curves on algebraic varieties. — L. Simon: Rectifiability of singular sets of multiplicity 1 minimal surfaces and energy minimizing maps. — C.H. Taubes: Homology cobordism and the simplest perturbative Chern-Simons 3-manifold invariant. — C.H. Taubes: Metabolic cobordism and the simplest perturbative Chern-Simons 3-manifold invariant.

**Different aspects of coding theory.** — American Mathematical Society Short Course, January 2-3, 1995, San Francisco, California. — Edited by Robert Calderbank. — Proceedings of Symposia in Applied Mathematics, vol. 50. — Un vol. broché,  $18 \times 26$ , de VII, 239 p. — Prix: £38.00. — American Mathematical Society, Providence RI, distributed by Oxford University Press, Oxford, 1995.

This book connects coding theory with actual applications in consumer electronics and with other areas of mathematics. It covers in detail the mathematical foundations of digital data storage and makes connections to symbolic dynamics, linear systems, and finite automata. It also explores the use of algebraic geometry within coding theory and examines links with finite geometry, statistics, and theoretical computer science.

**Dynamical systems and probabilistic methods in partial differential equations.** — 1994 Summer Seminar on Dynamical Systems and Probabilistic Methods for Nonlinear Waves, June 20-July 1, 1994, MSRI, Berkeley, CA. — Edited by P. Deift, C.D. Levermore, C.E. Wayne. — Lectures in Applied Mathematics, vol. 31. — Un vol. broché,  $18 \times 25$ , de IX, 268 p. — Prix: £22.00. — American Mathematical Society, Providence RI, distributed by Oxford University Press, Oxford, 1996.

Among the themes explored in this volume are the following: the increasing role of dynamical systems theory in understanding partial differential equations, the central importance of certain prototypical equations, such as the complex Ginzburg-Landau, nonlinear Schrödinger, and Korteweg-de Vries equations, problems in fluid mechanics and the limits of physically motivated heuristic theories of fluids, the role of probabilistic methods in studying turbulent phenomena.

David W. FARMER. — **Groups and symmetry: a guide to discovering mathematics.** — Mathematical world, vol. 5. — Un vol. broché,  $17,5 \times 25,5$ , de VII, 102 p. — Prix: £14.50. — American Mathematical Society, Providence, R.I., distributed by Oxford University Press, Oxford, 1996.

This book introduces the reader to the excitement of the original discovery. By means of a wide variety of tasks, readers are led to find interesting examples, notice patterns, devise rules to explain the patterns, and discover mathematics for themselves. The subject studied here is the mathematics behind the idea of symmetry, but the methods and ideas apply to all of mathematics. The only prerequisites are enthusiasm and a knowledge of basic high-school math.

Douglas LIND, Brian MARCUS. — **An introduction to symbolic dynamics and coding.** — Un vol. broché,  $15,5 \times 23,5$ , de IX, 495 p. — Prix: £19.95 (relié: £45.00). — Cambridge University Press, Cambridge, 1995.

This book is the first general textbook on symbolic dynamics and its applications to coding. It will serve as an introduction to symbolic dynamics for both mathematics and electrical engineering students. Mathematical prerequisites are relatively modest (mainly linear algebra at the undergraduate level). Topics are carefully developed and motivated with many examples. There are over 500 exercises to test the reader's understanding. The last chapter contains a survey of more advanced topics, and there is a comprehensive bibliography.

Michael LUBY. — **Pseudorandomness and cryptographic applications.** — Princeton computer science notes. — Un vol. broché,  $15,5 \times 23,5$ , de XVI, 234 p. — Prix: US\$24.95. — Princeton University Press, Princeton, N.J., 1996.



The first half of the book shows how to construct a pseudorandom generator from any one-way function. Building on this, the second half of the book shows how to construct other useful cryptographic primitives, such as private key cryptosystems, pseudorandom function generators, pseudorandom permutation generators, digital signature schemes, bit commitment protocols, and zero-knowledge interactive proof systems. The book stresses rigorous definitions and proofs.

Jens Carsten JANTZEN. — **Lectures on quantum groups.** — Graduate studies in mathematics, vol. 6. — Un vol. relié,  $18,5 \times 26$ , de 266 p. — Prix: £35.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Corby, U.K., 1996.

This book is an introduction to the theory of quantum groups. The main topic is the quantized enveloping algebras introduced independently by Drinfeld and Jimbo. Jantzen considers the crystal (or canonical) bases discovered independently by Lusztig and Kashiwara and looks at the quantum analogue of the Lie algebra  $SL$  and then at the quantum analogue of arbitrary finite dimensional complex Lie algebras.

Antanas LAURINČIKAS. — **Limit theorems for the Riemann zeta-function.** — Mathematics and its applications, vol. 352. — Un vol. relié,  $16,5 \times 24,5$ , de ix, 297 p. — Prix: Dfl. 215.00. — Kluwer Academic Publishers, Dordrecht, 1996.

This volume presents a wide range of results in analytic and probabilistic number theory. The full spectrum of limit theorems in the sense of weak convergence of probability measures for the modules of the Riemann zeta-function and other functions is given by Dirichlet series. Applications to the universality and functional independence of such functions are also given. Furthermore, similar results for Dirichlet  $L$ -functions and Dirichlet series with multiplicative coefficients are presented.

**Stochastic analysis and related topics V: The Silivri Workshop, 1994.** — Edited by H. Kőrezlioglu, B. Øksendal, A.S. Üstünel. — Progress in probability, vol. 38. — Un vol. relié,  $16,5 \times 24$ , de 294 p. — Prix: SFr. 108.00. — Birkhäuser, Boston, 1996.

This volume contains the invited lectures and refereed research papers presented at the 1994 workshop in Silivri. The selection of survey topics, from communication networks, mathematical finance, and Wiener space theory, demonstrates the principle of the common interests among many research workers in these powerful stochastic techniques. Stochastic analysis continues to be one of the most widely applicable mathematical tools available to research workers in a variety of scientific and engineering disciplines.

**Algebraic geometry and singularities.** — Edited by Antonio Campillo López, Luis Narváez Macarro. — Progress in mathematics, vol. 134. — Un vol. relié,  $16,5 \times 24$ , de xxi, 407 p. — Prix: SFr. 118.00. — Birkhäuser, Basel, 1996.

The focus of this volume lies on singularity theory in algebraic geometry. It includes papers documenting recent and original developments and methods in subjects such as resolution of singularities,  $D$ -module theory, singularities of maps and geometry of curves. The papers originate from the Third International Conference on Algebraic Geometry held in La Rabida, Spain, in December 1991. Since then, the articles have undergone a meticulous process of refereeing and improvement, and they have been organized into a comprehensive account of the state of the art in this field.

**Algebraic topology: new trends in localization and periodicity.** — Barcelona Conference on Algebraic Topology, Sant Feliu de Guíxols, Spain, June 1-7, 1994. — Edited by Carles Broto,

Carles Casacuberta, Guido Mislin. — *Progress in mathematics*, vol. 136. — Un vol. relié, 16×24, de IX, 400 p. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1996.

Central to this collection of papers are new developments in the general theory of localization of spaces. The present volume comprises the refereed articles submitted at the Conference on Algebraic Topology held in Santa Feliu de Guíxols, Spain, in June 1994. Several comprehensive articles on general localization clarify the basic tools and give a report on the state of the art in the subject matter. The text is therefore accessible not only to the professional mathematician but also to the advanced student.

Dmitri FOMIN, Alexey KIRICHENKO. — **Leningrad Mathematical Olympiads 1987-1991.** — *Contests in mathematics*, vol. 1. — Un vol. broché, 15×23, de XIX, 197 p. — Prix: US\$ 24.00. — MathPro Press, Westford, Mass., 1994.

The Leningrad Mathematical Olympiad is the oldest (founded in 1934) mathematics competition in Russia. The authors of this book have been involved with this competition for many years. The book includes complete solutions to all the problems and competition statistics. This material, formerly unavailable to the Western world, is now accessible in English for the first time.

Lawrence ZIMMERMAN, Gilbert KESSLER. — **ARML-NYSML contests 1989-1994.** — *Contests in mathematics*, vol. 2. — Un vol. broché, 15×23, de XVIII, 189 p. — Prix: US\$ 19.95. — MathPro Press, Westford, Mass, 1995.

This is the long-awaited-for sequel to the *NYSML-ARML Contest Book*. It contains the problems and solutions from the American Regions Mathematics League contests 1989-1994 and the New York State Mathematics League contests 1989-1992 — over 300 problems in all. The authors of this book were the principal problem writers for both contests. The book contains an answer key and complete solutions to all the problems. It also includes the complete set of tiebreaker questions (with their solutions) from 1983-1994. The problems are indexed by topic, and a listing of team and individual winners are also included.

**Potential theory and degenerate partial differential operators.** — Edited by Marco Biroli. — Partially reprinted from *Potential Analysis*, vol. 4, no. 4, 1995. — Un vol. relié, 16×25, de 188 p. — Prix: Dfl. 135.00. — Kluwer Academic Publishers, Dordrecht, 1995.

Recent years have witnessed an increasingly close relationship growing between potential theory, probability and degenerate partial differential operators. The theory of Dirichlet (Markovian) forms on an abstract finite or infinite-dimensional space is common to all three disciplines. This is the fascinating and important subject, central to many of the contributions to the conference on Potential Theory and Degenerate Partial Differential Operators, held in Parma, Italy, February 1994.

**New trends in probability and statistics, vol. 3: Multivariate statistics and matrices in statistics.** — Proceedings of the 5th Tartu Conference, Tartu-Pühajärve, Estonia, 23-28 May 1994. — Edited by E.-M. Tiit, T. Kollo and H. Niemi. — Un vol. relié, 15×23, de x, 342 p. — Prix: DM 252.00. — VSP, Utrecht, 1995.

The papers in this volume have been grouped in 6 sections, which reflect the volume and range of the problems discussed during the conference. Each section opens with an invited lecture. The sections are: asymptotic distribution and expansions; general linear regression models; tests in multivariate statistics; multivariate nonparametric models and their applications; discrimination and classification; matrices in statistics.

**Current topics in complex algebraic geometry.** — Edited by Herbert Clemens and János Kollár. — Mathematical Sciences Research Institute Publications, vol. 28. — Un vol. relié, 16×24, de xi, 158 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1995.

The 1992/93 academic year at the Mathematical Sciences Research Institute was devoted to complex algebraic geometry. This volume collects survey articles that arose from this event, which took place at a time when algebraic geometry was undergoing a major change. To put it succinctly, algebraic geometry has opened up to ideas and connections from other fields that have traditionally been far away. The articles in this book represent very well the change of direction and branching out witnessed by algebraic geometry in the the last few years.

**Ergodic theory of  $\mathbf{Z}^d$  actions.** — Proceedings of the Warwick Symposium 1993-4. — Edited by Mark Pollicott and Klaus Schmidt. — London Mathematical Society lecture note series, vol. 228. — Un vol. broché, 15×23, de viii, 484 p. — Prix: £29.95. — Cambridge University Press, Cambridge, 1996.

The classical theory of dynamical systems has tended to concentrate on  $\mathbf{Z}$ -actions or  $\mathbf{R}$ -actions. However in recent years there has been considerable progress in the study of higher dimensional actions (i.e.  $\mathbf{Z}^d$  or  $\mathbf{R}^d$  with  $d>1$ ). This book represents the proceedings of the 1993-4 Warwick Symposium on  $\mathbf{Z}^d$ -actions. It comprises a mixture of surveys and original articles that span many of the diverse facets of the subject, including important connections with statistical mechanics, number theory and algebra.

Olga OLEINIK. — **Some asymptotic problems in the theory of partial differential equations.** — Lezioni Lincee. — Un vol. broché, 14×22, de x, 202 p. — Prix: £12.95 (relié: £35.00). — Cambridge University Press, Cambridge, 1996.

The book is in two parts, the first being devoted to the study of the asymptotic behavior at infinity of solutions of a class of nonlinear second order elliptic equations in unbounded, in particular cylindrical, domains. The second part contains the most recent results of the author in the theory of homogenisation of partial differential equations and is concerned with questions about partially perforated domains and of solutions with rapidly alternating types of boundary conditions. These new asymptotic problems arise naturally in applications.

Jon F. CARLSON. — **Modules and group algebras.** — Notes by Ruedi Suter. — Lectures in mathematics ETH Zürich. — Un vol. broché, 17×24, de xi, 91 p. — Prix: SFr. 28.00. — Birkhäuser Verlag, Basel, 1996.

The book presents an entirely new approach to the subject based on the recent development in this field. Basically the shift has been towards a much more categorical view of representation theory, and an expansion of the viewpoint to include infinitely generated modules as well as the finitely generated ones. Some of the constructions in the category of all modules have had new and original applications for the category of finitely generated modules.

Werner O. AMREIN, Anne BOUTET DE MONVEL, Vladimir GEORGESCU. —  **$C_0$ -groups, commutator methods and spectral theory of  $N$ -body Hamiltonians.** — Progress in mathematics, vol. 135. — Un vol. relié, 16×24, de xiv, 460 p. — Prix: SFr. 108.00. — Birkhäuser Verlag, Basel, 1996.

One of the purposes of this volume is to present a refinement of the original method due to Mourre leading to essentially optimal results in situations as varied as ordinary differential operators, pseudo-differential operators and  $N$ -body Schrödinger hamiltonians. Another topic is a new algebraic framework for the  $N$ -body problem allowing a simple and systematic treatment of a large classes of many-channel hamiltonians.



Luis A. CAFFARELLI, Xavier CABRÉ. — **Fully nonlinear elliptic equations.** — American Mathematical Society colloquium publications, vol. 43. — Un vol. relié,  $19 \times 26$ , de vi, 104 p. — Prix: £29.00. — American Mathematical Society, Providence RI, distributed by Oxford University Press, 1995.

Viscosity solutions of elliptic equations. — Alexandroff estimate and maximum principle. — Harnack inequality. — Uniqueness of solutions. — Concave equations. —  $W^{2,p}$  regularity. — Hölder regularity. — The Dirichlet problem for concave equations.

Helmut SALZMANN, Dieter BETTEN, Theo GRUNDHÖFER, Hermann HÄHL, Rainer LÖWEN, Markus STROPEL. — **Compact projective planes: with an introduction to octonion geometry.** — De Gruyter expositions in mathematics, vol. 21. — Un vol. broché,  $18 \times 25$ , de XIII, 688 p. — Prix: DM 258.00. — Walter de Gruyter, Berlin, 1995.

This is the first book providing a systematic exposition of 40 years of research on topological projective planes. Full proofs of the highlights of the theory are presented, including prerequisites from Lie theory and classical quaternion and octonion geometry. A basic reference text with a bibliography containing more than 700 items.

Martin BARNER, Friedrich FLOHR. — **Analysis II.** — 3., durchgesehene Auflage. — De Gruyter Lehrbuch. — Un vol. broché,  $15,5 \times 23$ , de 449 p. — Prix: DM 48.00. — Walter de Gruyter, Berlin, 1996.

„...Der zweite Band umfasst im wesentlichen die Differential- und Integralrechnung für mehrere Variablen. Dabei werden nach vorheriger Diskussion des Lebesgue-Masses auf  $\mathbf{R}$  der Messbarkeitsbegriff und schliesslich das Lebesgue-Integral behandelt. Die Darstellung ist sehr ausgewogen, stets gut motiviert und auf die wesentlichen Punkte ausgerichtet. Jedes Kapitel enthält auch einige Übungsbeispiele...“